

-40V P-Channel Mosfet

FEATURES

- $R_{DS(ON)} \leq 9.2m\Omega$ (7.1m Ω Typ.)
@ $V_{GS} = -10V$
- $R_{DS(ON)} \leq 13m\Omega$ (9.3m Ω Typ.)
@ $V_{GS} = -4.5V$
- AEC Q101 qualified
- Green Product (RoHS compliant)

TO-252-2L

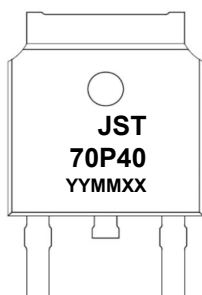


1. GATE
2. DRAIN
3. SOURCE

APPLICATIONS

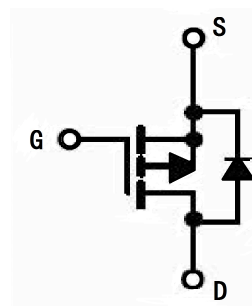
- Automotive Systems
- PWM Applications
- Load Switch
- Power Management

MARKING



YYMM: Date Code(year &month)
XX: Internal Code

P-CHANNEL MOSFET



MAXIMUM RATINGS ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-40	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current @ $V_{GS} = -10V$ <small>note1</small>	$T_C = 25^\circ C$	-70	A
		$T_C = 100^\circ C$	-50	A
I_{DM}	Pulsed Drain Current <small>note2</small>		-280	A
E_{AS}	Single Pulsed Avalanche Energy <small>note3</small>		182	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	88	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.7	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS Tc=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -40V, V _{GS} =0V	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note4</small>	V _{GS} = -10V, I _D = -30A	-	7.1	9.2	mΩ
		V _{GS} = -4.5V, I _D = -20A	-	9.3	13	
Dynamic Characteristics <small>note5</small>						
C _{iss}	Input Capacitance	V _{DS} = -20V, V _{GS} =0V, f=1.0MHz	-	7202	-	pF
C _{oss}	Output Capacitance		-	626	-	pF
C _{rss}	Reverse Transfer Capacitance		-	438	-	pF
Q _g	Total Gate Charge	V _{DS} = -20V, I _D = -20A, V _{GS} = -10V	-	116	-	nC
Q _{gs}	Gate-Source Charge		-	23	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	21	-	nC
Switching Characteristics <small>note5</small>						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -20V, I _D = -20A, V _{GS} = -10V, R _{GEN} =3Ω	-	15.2	-	ns
t _r	Turn-on Rise Time		-	89	-	ns
t _{d(off)}	Turn-off Delay Time		-	123	-	ns
t _f	Turn-off Fall Time		-	102	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S = -30A	-	-	-1.2	V
trr	Reverse Recovery Time	V _{GS} =0V, I _S = -20A,	-	25	-	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	-	17	-	nC

Notes:1. $T_C=25^\circ C$ Limited only by maximum temperature allowed. Calculated continuous current based on maximum allowable junction temperature.

2. $PW \leq 10\mu s$, Duty cycles $\leq 1\%$

3. EAS condition: $T_J = 25^\circ C$, $V_{DD} = -20V$, $V_G = -10V$, $L = 0.5mH$, $R_G = 25\Omega$, $I_{AS} = -27A$

4. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

5. Guaranteed by design, not subject to production testing

TYPICAL PERFORMANCE CHARACTERISTICS

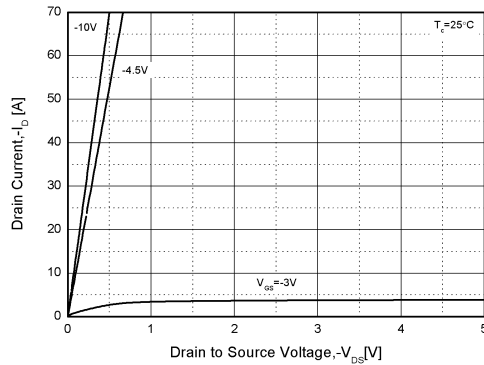


Figure1. Output Characteristics

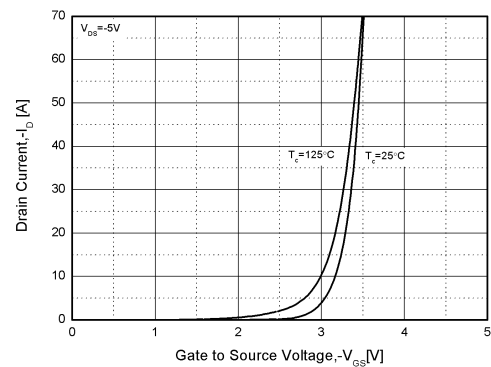


Figure2. Transfer Characteristics

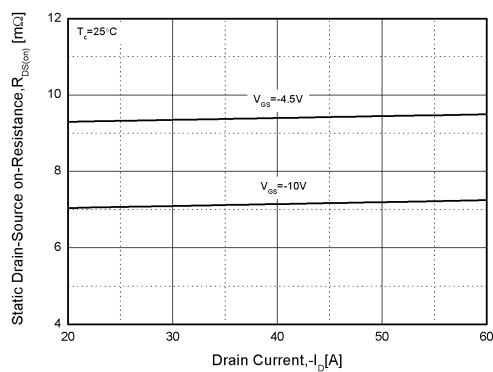


Figure3. Rdson-Drain Current

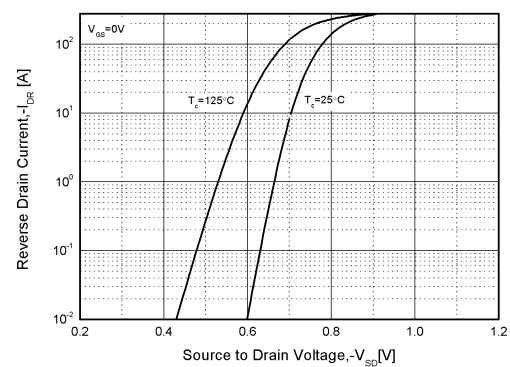


Figure4. Typical Source-Drain Diode Forward Voltage

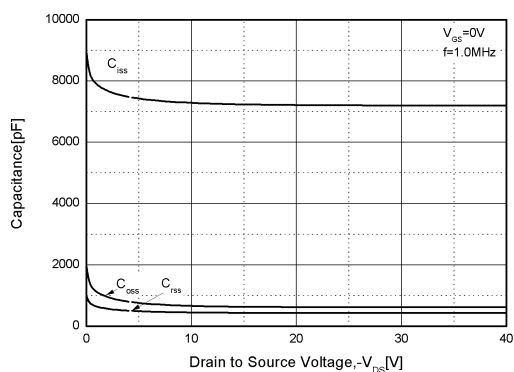


Figure5. Capacitance Characteristics

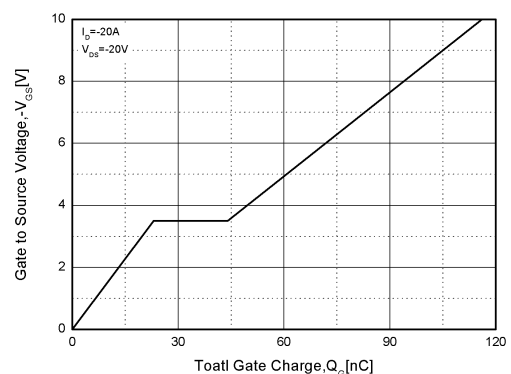


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

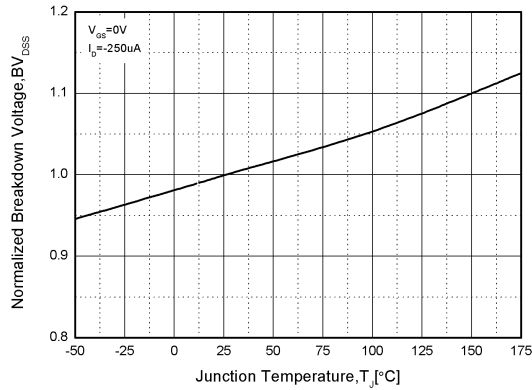


Figure7. Normalized Breakdown Voltage vs. Temperature

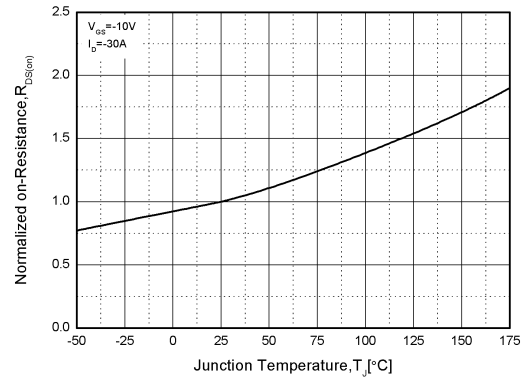


Figure8. Normalized on Resistance vs. Temperature

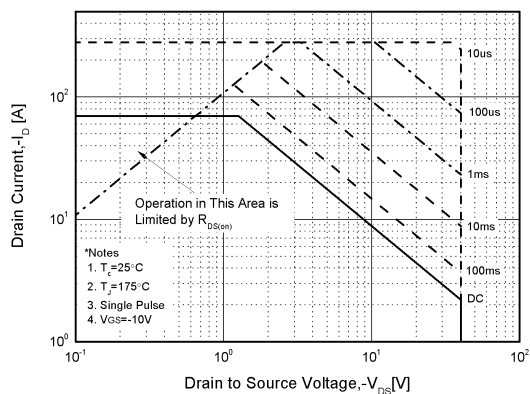


Figure9. Safe Operation Area

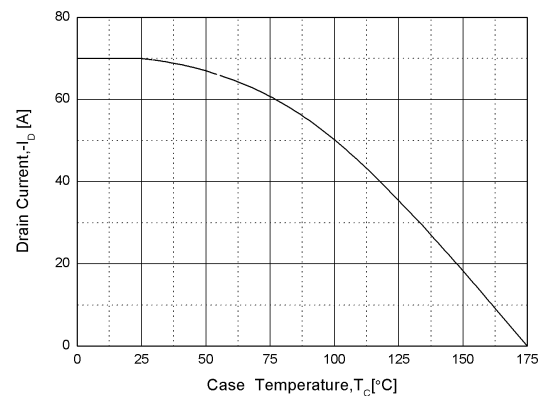


Figure10. Drain Current vs. Case Temperature

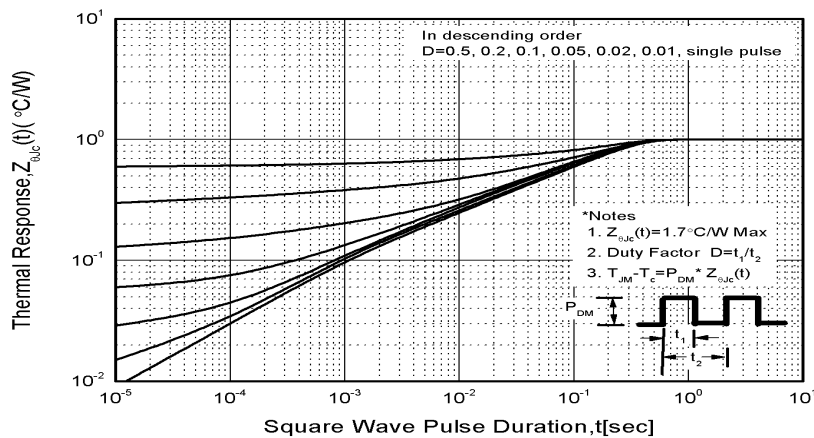
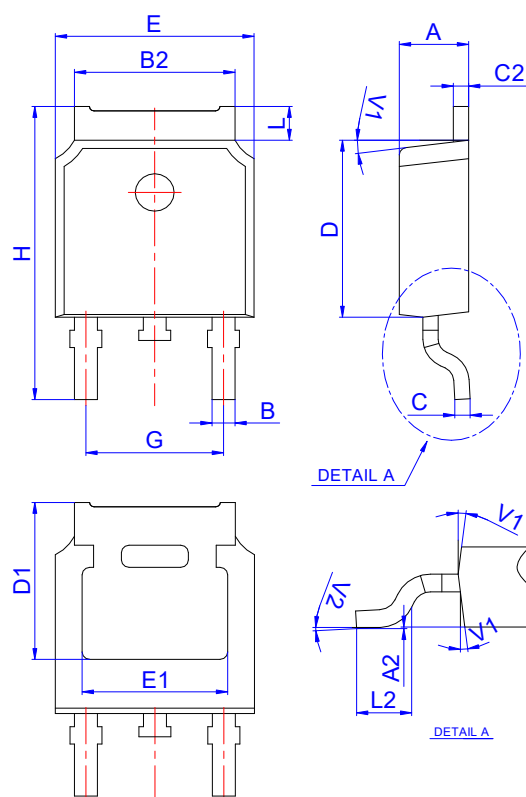


Figure11. Transient Thermal Response Curve

TO-252-2L PACKAGE OUTLINE DRAWING



Symbols	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°